

## ENGINEER SUPPORT TO FUTURE FULL-SPECTRUM OPERATIONS

BY

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USAWC STRATEGY RESEARCH PROJECT

**ENGINEER SUPPORT TO FUTURE FULL-SPECTRUM OPERATIONS**

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## **ABSTRACT**

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Afghanistan and Iraq has shown that current warfare is a brigade commander's fight. With the transformation to modularized BCTs, it is clear that future combat will continue to be executed at the BCT level. The nature of full spectrum combat also points to a continually changing environment that will require these BCTs to transition from stability to major combat operations rapidly and often.

The Engineer Regiment also has transformed in order to be better prepared to face the future threats. The result of that transformation has been a modularized Echelon Above Brigade force and a smaller engineer presence in the BCTs. The current BCT structure is very under represented by engineer forces and does not provide the BCT commander with adequate assets to complete the missions he is likely to face.

By reviewing the future operational environment, the brigade combat team organization design, and the current engineer transformation plan, this project will attempt to identify the gaps in the current engineer transformation plan. It will then argue that reorganization of a portion of the engineer battalions into multifunctional battalions in direct support of BCTs is an effective way of bridging that gap.



## ENGINEER SUPPORT TO FUTURE FULL-SPECTRUM OPERATIONS

In light of the growing threats to the Nation posed by states and non-state movements and organizations, the environment in which our Soldiers will operate will remain extraordinarily dangerous for the foreseeable future. Our mission within this environment will remain largely unchanged. The Army, as a vital ground component of the Joint Team, will be required to conduct prompt, sustained combat and stability operations. We will continue to provide the forces and capabilities to the Combatant Commanders needed to sustain the full range of U.S. global commitments in the face of growing challenges.<sup>1</sup>

—2007 Army Posture Statement

There are two likely scenarios that United States military forces need to be prepared to encounter in the future. Based on the insurgent's success in Iraq and Afghanistan, the first threat that US forces are likely to face is a similar asymmetric, insurgent threat. Smaller, non-peer level enemies will look at the successes of the insurgents in Iraq and will attempt to exploit perceived weaknesses in US forces in a similar manner.

The other likely scenario is that of a peer or near peer opponent engaging the military in a Major Combat Operation (MCO) – traditional force-on-force conventional warfare. Although, with the demise of the Soviet Union, the United States military is currently viewed as without a military equal worldwide, that could very easily change in the next fifteen to twenty years. China clearly has the capability to step up to the same level with the United States, as well as Russia. The risk to the security of the United States from a defeat in a MCO is huge and catastrophic, and therefore, our force structure needs to be designed to succeed in the MCO environment as well.

So the key is that the United States military can not just focus on Counter-Insurgency (COIN) operations, or on MCO. Since the risk associated with MCO and the



probability of COIN operations are both high, we must be prepared for both. Failure to be prepared for both will create vulnerability that will surely be exploited by the thinking enemy that we face.

The modularize brigade, or Brigade Combat Team (BCT), is the organizational building block that the Army is using to prepare for this future. According to the 2007 U.S. Army Posture Statement, “to fulfill the central role that will be demanded of land-power in the 21st Century, we are becoming a strategically agile, expeditionary force reliant on modular brigades. These modular brigades are designed to deal with the full spectrum of challenges our Nation will face.”<sup>2</sup>

Engineer forces also have been transformed, resulting in the deactivation of all the old divisional engineer battalions and the redistribution of scaled down versions of their engineer companies into the BCTs. The rest of the engineer force pool also has been transformed into modularized, specialized companies and battalions that operate in the Echelon Above Brigade (EAB) environment. The planning concept for these companies is that their modular nature will allow for tailoring of forces needed to support the BCTs and higher level organizations.

While in concept this modular engineer force structure would seem to be complementary and supportive of the modularize brigade organization, BCT force structure constraints have actually led to an engineer force that is not as responsive to the BCT concept. The specialization that modularization has created will take away some of the flexibility and agility that has been one of the strengths of engineer leaders in the past.

By reviewing the future operational environment, the brigade combat team organization design, and the current engineer transformation plan, I will attempt to identify what I see as the gaps in the current engineer transformation plan. I will then argue that reorganization of a portion of the engineer battalions into multifunctional battalions in direct support of BCTs is an effective way of bridging that gap.

### Future Operational Environment

Joint doctrine defines the operational environment as a “composite of the conditions, circumstances, and influences that affect the employment of capabilities and bear on the decisions of the commander.”<sup>3</sup> At the joint level, it includes the conditions throughout a commander’s battle space and includes all friendly, enemy, and neutral systems relevant to a specific joint operation. More simply put, from an Army perspective, the operational environment is the conditions that Army forces will face while fighting future conflicts. This environment has continued to become more complex over time. As FM 3-0 states, “late 20th century brought historic changes—greater global economic integration, a pervasive and unregulated information environment, and a new range of threats. Today, local and regional conflicts have emerged as significant challenges that extend far beyond their geographic boundaries. Global terrorism, state failure, humanitarian disasters, and the descent of regions of the world into anarchy pose significant security challenges to the United States and its partners.”<sup>4</sup>

As we start looking at the operational environment of the future, one of the first things we need to address are the potential threats future U.S. forces will encounter. Much of the recent focus has been on unconventional, asymmetric threats against the

United States. Quick initial victories during the conventional warfare phases in Afghanistan and Iraq coupled with the follow-on enemy tactics lend credence to this belief. As stated in FM 3-24, “the recent success of U.S. military forces in major combat operations undoubtedly will lead many future opponents to pursue asymmetric approaches. Because the United States retains a significant advantage in fires and technical surveillance, a thinking enemy is unlikely to choose to fight U.S. forces in open battle.”<sup>5</sup>

Secretary of Defense Robert Gates also acknowledged this view in a speech at Kansas State in November 2007: “The real challenges we have seen emerge since the end of the Cold War – from Somalia to the Balkans, Iraq, Afghanistan, and elsewhere – make clear we in defense need to change our priorities to be better able to deal with the prevalence of what is called “asymmetric warfare.” ... it is hard to conceive of any country challenging the United States directly in conventional military terms – at least for some years to come. Indeed, history shows us that smaller, irregular forces – insurgents, guerrillas, terrorists – have for centuries found ways to harass and frustrate larger, regular armies and sow chaos. We can expect that asymmetric warfare will be the mainstay of the contemporary battlefield for some time.”<sup>6</sup>

One of the key phrases in Secretary Gates’ speech was “at least for some years to come”. There is little doubt that in the short term there is not a peer threat to the United States military. But as we look to the near future, it is conceivable that one could develop. As FM 3-0 notes, “the United States currently has the pre-eminent conventional and nuclear forces on the planet. However, this status is not guaranteed. Many nations maintain powerful conventional forces and not all are friendly to the

United States. Some of these potential hostile powers have weapons of mass destruction. ... Potential enemies will continually seek ways and means to negate U.S. military advantages.”<sup>7</sup> The previous Secretary of Defense shared similar views in the 2005 National Defense Strategy, “as formidable as U.S. capabilities are against traditional [nation state] opponents, we cannot ignore the challenges that such adversaries might present. Traditional challenges require us to maintain sufficient combat capability in key areas of military competition.”<sup>8</sup>

So the true threat and challenge that we face is the ability to maintain the capability to conduct both conventional and unconventional warfare. The reality is that we have to be prepared to fight both conventional and unconventional war simultaneously. The concept has become known as the mosaic nature of warfare. Often the environment faced by forces can change based on where on the battlefield they are operating. As described in FM 3-24, “insurgents may use guerilla tactics in one province while executing terrorist attacks in and an urban approach in another. The result is more than just a “three-block war”: it is a shifting “mosaic war” that is difficult for the counterinsurgents to envision as a coherent whole.”<sup>9</sup>

### Full Spectrum Operations

This “mosaic” concept that future U.S. forces need to be capable of conducting a wide range of military operations from stability operations through traditional combat operations is one of the underlying concepts of the Army’s full spectrum operations doctrine. Future forces need to be prepared to operate in a variety of environments ranging from peace through insurgency to general war, known as the spectrum of conflict.<sup>10</sup>

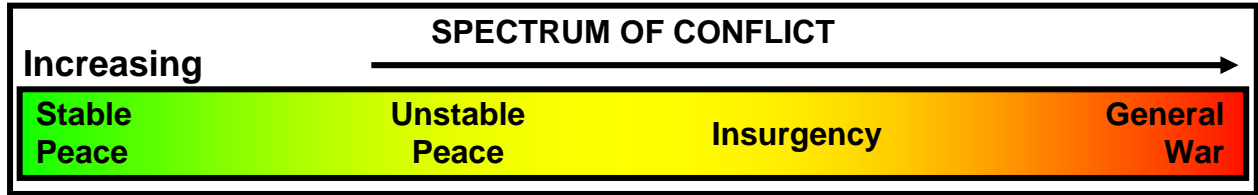


Figure 1.

Full spectrum operations is the operational concept that the Army will use to deal with the complex operational environment that it will face across the future spectrum of conflict. According to FM 3-0, in full spectrum operations, “Army forces combine offensive, defensive, and stability or civil support operations simultaneously as part of an interdependent Joint force to seize, retain, and exploit the initiative to achieve decisive results. They employ synchronized action – lethal and non-lethal – proportional to the mission, and informed by a thorough understanding of all dimensions of the operational environment.”<sup>11</sup>

During full spectrum operations, commanders must plan for and be prepared to execute simultaneous offensive, defensive and stability (and civil support) operations. Some of the tasks and purposes under each operation are listed in Figure 2<sup>12</sup>.

<p><b>Offense</b></p> <p><b>Primary Tasks</b></p> <ul style="list-style-type: none"> <li>• Movement to contact</li> <li>• Attack</li> <li>• Exploitation</li> <li>• Pursuit</li> </ul> <p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>• Dislocate, isolate, disrupt, and destroy enemy forces</li> <li>• Seize key terrain</li> <li>• Deplete the enemy of resources</li> <li>• Develop intelligence</li> <li>• Deceive and divert the enemy</li> <li>• Create a secure environment for stability operations</li> </ul>	<p><b>Defense</b></p> <p><b>Primary Tasks</b></p> <ul style="list-style-type: none"> <li>• Mobile defense</li> <li>• Area defense</li> <li>• Retrograde</li> </ul> <p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>• Deter or defeat enemy offensive operations</li> <li>• Gain time</li> <li>• Achieve economy of force</li> <li>• Retain key terrain</li> <li>• Protect the populace, critical assets, and infrastructure</li> <li>• Develop intelligence</li> </ul>
<p><b>Stability</b></p> <p><b>Primary Tasks</b></p> <ul style="list-style-type: none"> <li>• Civil security</li> <li>• Civil control</li> <li>• Restore essential services</li> <li>• Support to governance</li> <li>• Support to economic and infrastructure development</li> </ul> <p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>• Provide a secure environment</li> <li>• Secure land areas</li> <li>• Meet the critical needs of the populace</li> <li>• Develop local capacity for security, economy, and rule of law</li> <li>• Gain support for host-nation government</li> <li>• Shape the environment for interagency and host-nation success</li> </ul>	<p><b>Civil Support</b></p> <p><b>Primary Tasks</b></p> <ul style="list-style-type: none"> <li>• Provide support in response to disaster</li> <li>• Support civil law enforcement</li> <li>• Provide other support as required</li> </ul> <p><b>Purposes</b></p> <ul style="list-style-type: none"> <li>• Save lives</li> <li>• Restore essential services</li> <li>• Maintain or restore law and order</li> <li>• Protect infrastructure and property</li> <li>• Maintain or restore local government</li> <li>• Shape the environment for interagency success</li> </ul>

Figure 2. Elements of Full Spectrum Operations

FM 3-0 combines the spectrum of conflict with operational themes and the elements of full spectrum operations to produce the following continuum of operations<sup>13</sup>:

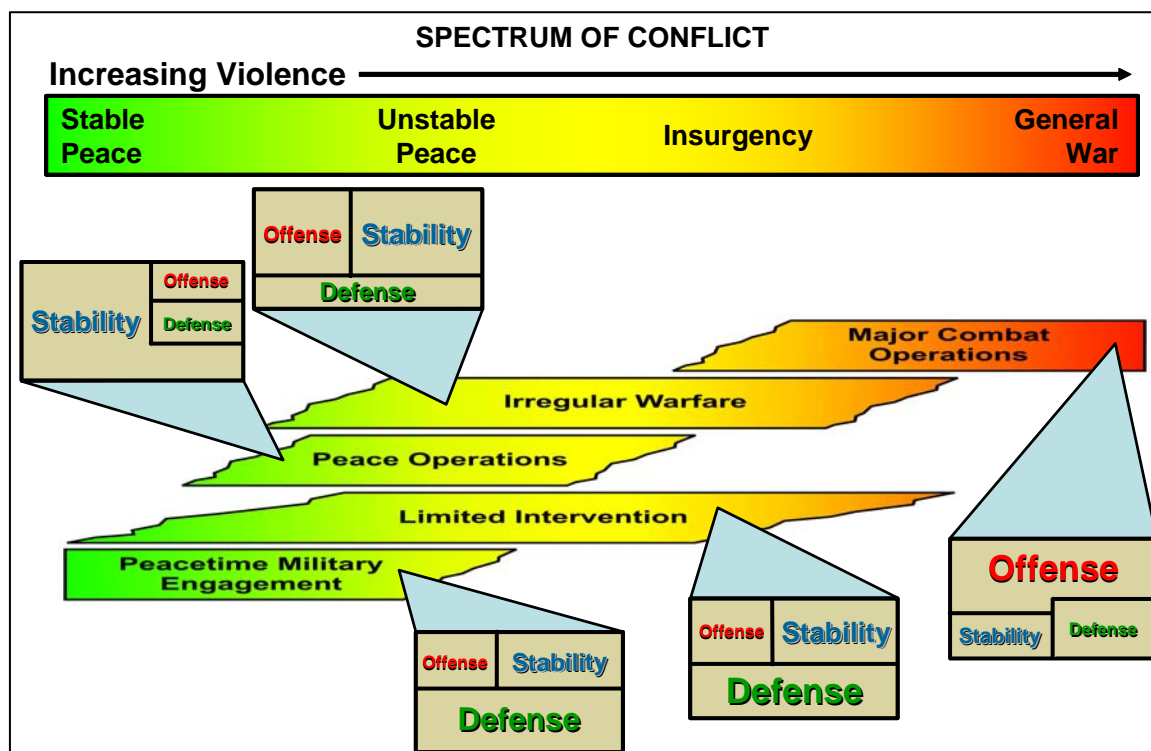


Figure 3. Continuum of Operations

This continuum shows a couple of critical aspects of full spectrum operations. First, it shows that there is an overlap between operational themes such as limited intervention,

irregular warfare and major combat operations; and that multiple operational themes could be going on at the same time. Secondly, it shows that depending on which operational theme a force is operating in, the ratio of offensive to defensive to stability operations may be different. For example, if a force is conducting major combat operations, the majority of effort will be given to offensive operations followed by defensive operations with little going to stability operations. If a force is conducting peace operations, the ratios are reversed with the majority of effort going to stability operations. A related concept that this diagram shows is that no matter what type of operation that forces are conducting – major combat operations all the way through peacetime military engagement – we must plan for offensive, defensive and stability operations. As we look at future force structure, doctrine and training issues, we must ensure that we have maintained the flexibility to handle the full spectrum of operations that our forces are likely to face.

#### Brigade Combat Team Organization Design

“BCTs are the primary organizations designed to fight tactical engagements and battles.”<sup>14</sup> There are three types of BCTs: the Heavy Brigade Combat Team (HBCT), the Stryker Brigade Combat Team (SBCT), and the Infantry Brigade Combat team (IBCT). Figure 4 shows the basic organization of each type.

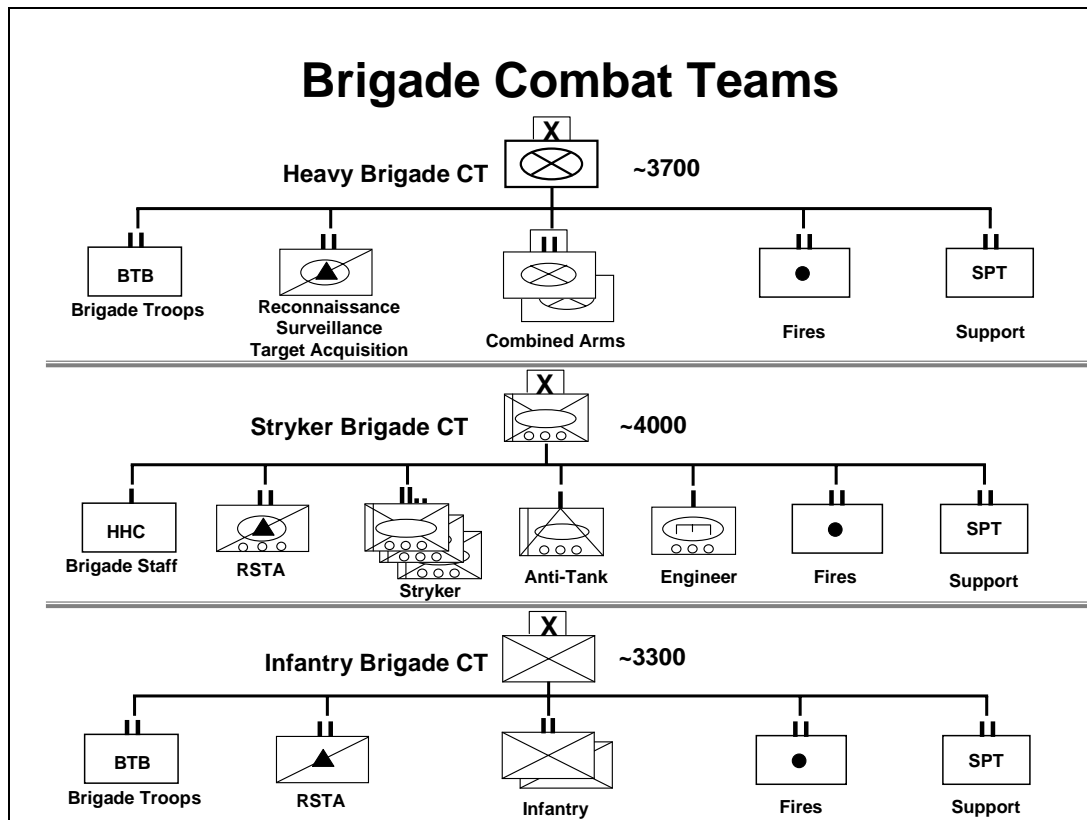


Figure 4. Brigade Combat Teams<sup>15</sup>

The brigade combat teams (BCTs) are, and will be, the common unit of employment for the U.S. Army. There will still be division and Corps headquarters, but BCTs will remain the allocation level for forces need. Some fights will only require one or two BCTs – such as Afghanistan – while others - such as Iraq - could require 15 to 20 or more BCTs. The Brigade Combat Team structure was developed to give the Army a more expeditionary force than the previous division centric organization. BCTs would be self-contained, sustainable, lethal forces packages that could more effectively be deployed to support Combatant Commanders' requirements. In concept, they also were organized with capabilities for the full spectrum of missions that the future force would face. And if a mission was beyond their basic capability set, the BCTs were designed to



accept other modules – or plugs – with added capabilities in order to accomplish the mission.

While the BCT organization has done much to create a more tailorable and reactive force pool, it has done so at a cost of some of the robust capability of the previous brigade structure. One area that this loss of capability is obvious is with the reduction from three to two maneuver battalions in the HBCTs and IBCTs. The BCTs also have a stripped down logistics organization and small enabler packages – most notably engineers that will be discussed in the next section. The result is in fact a smaller, more rapidly deployable organization, but one with significantly less capability of its predecessor.

Regardless of these shortfalls, the BCT will remain the primary organizational structure for the current and near term future Army force. Modularization is well underway and the Army has committed to this new construct. The current plan calls for a total of 76 BCTs - with 40 in the Active Component and 36 in the Reserve Component – by FY2012.<sup>16</sup>

### Current Engineer Transformation Plan

The current plan for transformation of the engineer force structure focuses on two levels of engineer forces – Brigade Combat Team (BCT) engineer support and Echelon Above Brigade (EAB) engineer organizations<sup>17</sup>.

#### Brigade Combat Team (BCT) Engineer Support

The new BCT structure includes an organic engineer company within the Brigade Special Troops Battalion (BSTB) and a small Brigade Engineer planning cell as part of the brigade staff. There are three different variants of both the engineer company and

the Brigade Engineer cell, one for each of the three types of BCTs – Infantry Brigade Combat Team (IBCT), Heavy Brigade Combat Team (HBCT) and Stryker Brigade Combat Team (SBCT). The engineer company in an IBCT has two sapper platoons, a small (eleven personnel) equipment section and a total of 75 soldiers. The HBCT engineer company has three sapper platoons, an equipment platoon, and a total of 151 soldiers (see Figure 5)<sup>18</sup>.

The SBCT engineer company has three sapper platoons, a mobility support platoon and a total of 131 soldiers. The mission for all three companies is to provide organic mobility, force protection, limited counter-mobility, survivability, and sustainment engineer support to their organic BCT.<sup>19</sup> All of these companies are task organized under the Brigade Special Troops Battalion within the BCT.

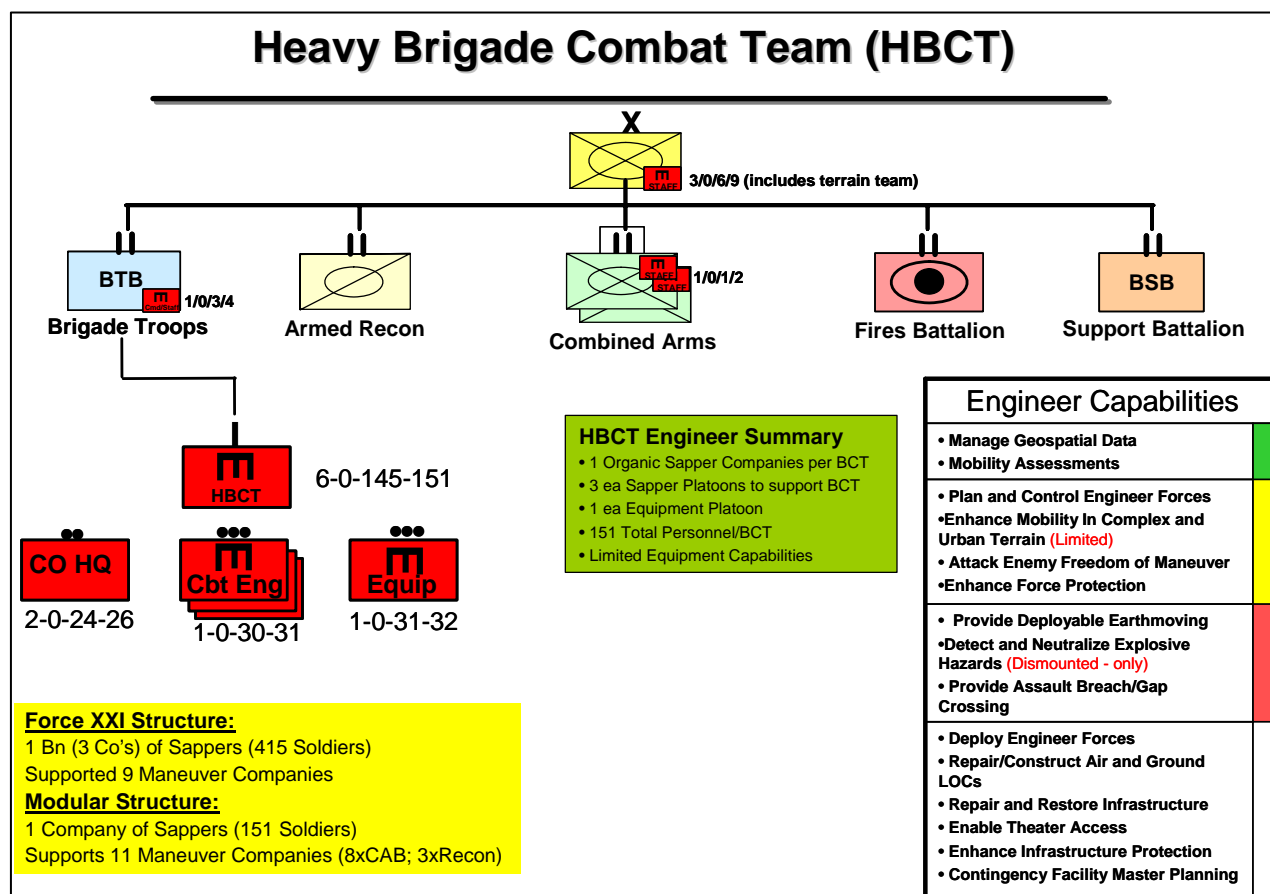


Figure 5. Engineers in a HBCT

On the brigade staff side, each type of BCT has a staff engineer cell and a geospatial engineer team (which normally ends up working for the brigade S2). The staff engineer cell ranges in size from 3- 5 soldiers and is led by an Engineer major who serves as the brigade engineer. The mission for this brigade engineer cell is to plan and coordinate all engineer operations within the brigade area of operations. There also are battalion staff engineers (either a engineer captain or a staff sergeant) in the combined arms battalions and infantry battalions within the HBCTs and IBCTs. These staff engineers are responsible for coordinating with supporting engineer units and advising their commander on engineer operations<sup>20</sup>

## Echelon Above Brigade Engineer Organizations

EAB engineer organizations are characterized by the concept of modularity. The engineer force pool is defined as all operational forces not organic to a BCT, ACR or embedded in a headquarters staff<sup>21</sup>. This pool is organized into core units, command and control units, and specialized engineer capability.

Core units are the modularized engineer companies that form the building blocks for the modularize force. There are six main types of core units: Sapper companies, Mobility Augmentation Companies (MAC), Multi-Role Bridge Companies (MRBC), Clearance companies, Horizontal Construction companies, Vertical Construction companies and Engineer Support Companies (ESC). These companies are designed to provide a specific engineer capability to the supported force. They normally are task organized under an engineer battalion, but could also be attached to a Brigade Special Troops battalion or directly to a supported maneuver element.

Engineer command and control units are the battalion, brigade and theater engineer commands which are designed to provide command and control and support to subordinate engineer units. At the battalion level, there are two main types of battalions – a Combat Effects battalion and a Construction Effects battalion. Both types of battalions have similar staff structure. The only difference is the type of core companies that are task organized under the headquarters. A Combat Effects battalion (shown in Figure 6)<sup>22</sup> is comprised primarily of sapper, clearance, engineer support, and mobility augmentation companies (in addition to a headquarters and separate Field Support Company (FSC)).

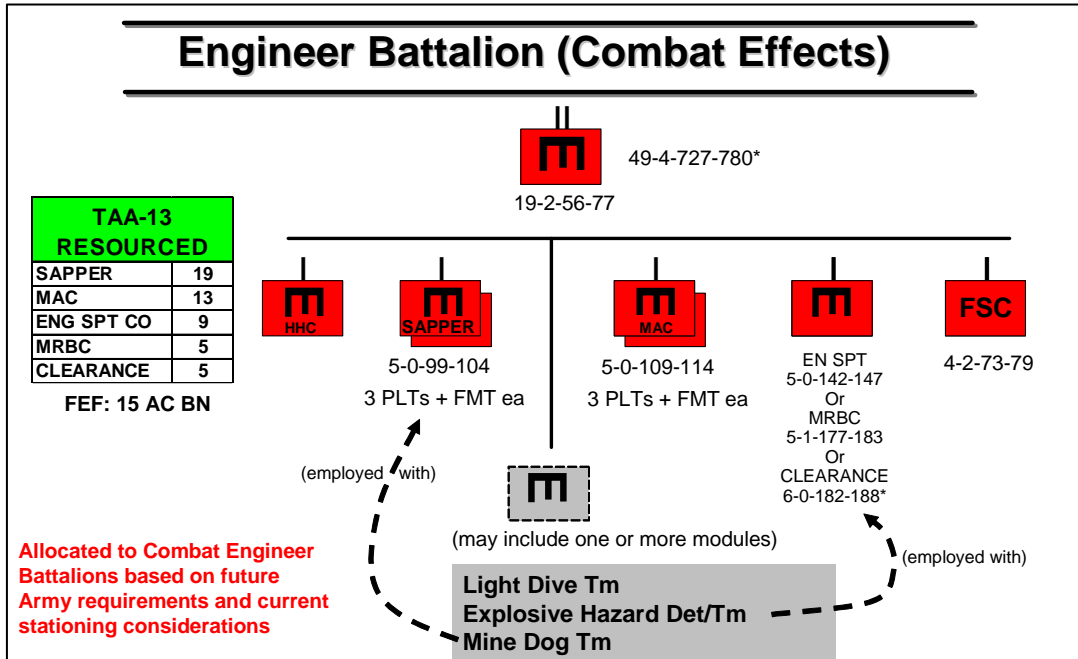


Figure 6. Engineer Battalion (Combat Effects)

A Construction Effects battalion (see Figure 7)<sup>23</sup>, on the other hand, is comprised primarily of vertical and horizontal construction companies (in addition to a headquarters, a Survey and Design Section and a similar FSC).

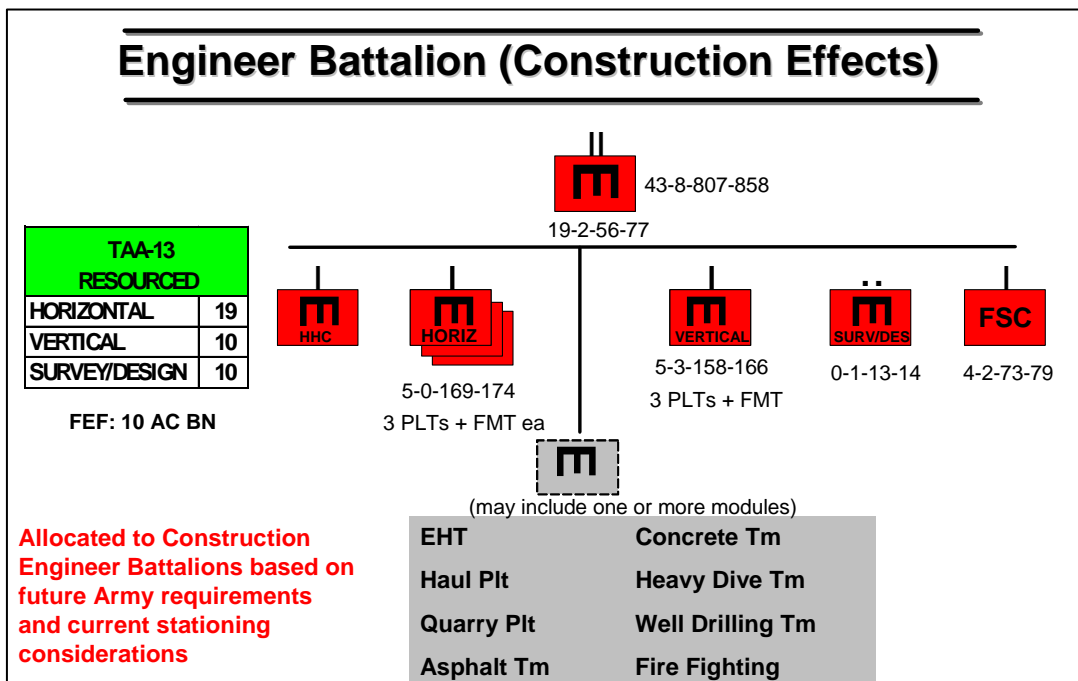


Figure 7. Engineer Battalion (Construction Effects)

The number of each company per battalion is not set. The companies are the building blocks, i.e. are the requirements' drivers. Battalion headquarters are established to command and control three to five engineer companies. The result is that one Combat Effects battalion may have 2 sapper companies, 1 ESC, 1 MAC and an FSC; while another Combat Effects battalion could have 1 sapper company, 2 ESCs, a clearance company and an FSC. The same variation is possible within the Construction Effects battalions.

The third element of the engineer force pool is the specialized engineer capabilities. These units range all the way for a 6 person explosive hazard team up to a 170 person Pipeline Construction Company. They each are self contained modules that provide specific engineer capabilities to the maneuver force. They can be plugged in to either type of engineer battalion headquarters depending on mission requirements. The FY08 force structure has a total of 85 engineer battalions (15 active duty Combat Effects battalions, 10 active duty Construction Effects battalions, 44 reserve component Combat Effects battalions, 16 reserve component Construction Effects battalions). This will grow to 97 total battalions in FY11<sup>24</sup>.

### Gaps

The critical question to be asked here is whether the current engineer force structure transformation will result in an Engineer Regiment that is best postured to support the Army into the future. And if it is not, what are the gaps, and what are potential solutions for the gaps?

I would argue that there are two main gaps. The first is shortfall in engineer support to the main effort – specifically the under-representation of engineer expertise

and forces within the BCTs. The second is a tendency toward specialization versus multi-functionality.

### Under-Representation

The Army has determined that the BCT is the primary warfighting unit within its structure. The BCT trains, deploys and executes its missions with its organic forces, which includes a company (-) of engineers and a small engineer planning staff. If we assume that, as defined in full spectrum operations, the BCTs will be called upon to simultaneously execute stability, offensive and defensive operations; and if we assume that all of these operations will require significant engineer planning and expertise to execute, it would seem that we have not weighted the main effort sufficiently.

As you look at the BCTs' mission sets all the way across the spectrum from peace operations to major combat operations, it is clear that there is a heavy engineer flavor to these missions. These engineer missions really boil down to two main functions: mobility support and construction oversight. The tasks performed within these functions will change depending on where the conflict is on the peace operations to MCO spectrum, but the functions will remain constant. For example, in a peace/stability environment, the mobility function will focus on route clearance, IED defeat, combat trails construction and extension of the supported government's reach. Construction oversight will be very heavy during this type of operation – covering everything from Forward Operating Bases (FOB) construction and maintenance to the numerous nation building tasks such as contract construction oversight and Commander's Emergency Relief Program (CERP) projects.

In a MCO environment, on the other hand, mobility support will shift to more breaching and route clearance, combat trail construction and bridging in direct support of combat movements. The construction function will shift to force protection/survivability missions, construction of Combat Outpost (COP) and Assault Landing Zones (ALZs), etc.

In either case, the BCT commander needs a commander and/or a staff element able to successfully integrate all the engineer multipliers with the overarching maneuver plan to attain success on the battlefield. I do not believe that the current construct enables this to happen. There are many BCTs that are effectively integrating these elements within their battle space, but often that responsibility is being done by non-engineers on the staff who have picked up those responsibilities on the fly. There also are examples where there is an engineer BSTB commander or a battalion with a strong engineer battalion commander OPCON to a BCT, or situations where there is a very strong BCT engineer who has developed a good relationship with both the BCT commander and supporting engineer forces – but the current structure doesn't institutionalize this relationship.

In addition to engineer expertise, the current BCT structure also lacks the engineer forces needed to accomplish all the missions required by the BCT. One company with either two (IBCT) or three (HBCT and SBCT) engineer platoons and a very small equipment section is not adequate to support the maneuver units within a BCT. In MCO, these engineers can not provide the necessary mobility, counter-mobility and survivability support for the maneuver elements of the BCT. In stability operations, these forces are not sufficient to provide the route clearance and construction support that that



BCT needs. The result often is that since these elements are not sufficient to do their engineer missions, they are instead used for their secondary mission to fight as infantry. The result is an over-reliance of the BCT on EAB engineer assets to provide necessary engineer support.

The Army is focused on the brigade combat team as its primary war fighting element. We need to ensure that our engineer force is structured to support operations at the BCT level. I do not see the current structure as doing this effectively.

#### Training and Readiness Oversight (TRO) for BCT Engineers

The current BCT structure has eliminated the divisional engineer battalion commander and placed the responsibility for TRO of the separate BCT engineer companies on the BSTB commanders. The BSTBs are no longer coded Engineer and in fact are being filled by any 01A commander. While these BSTB commanders will continue to do an exceptional job with common and warrior task type training, if they are not Engineers, they will have difficulty providing the Engineer mentorship, training guidance, oversight, etc. that the previous Engineer battalion commander was able to provide.

Another related issue is the geographic dispersion of the EAB battalions under the current structure. They are all assigned for TRO to one of the five functional Engineer Brigades. Often these brigades are separated by several states and many hundreds of miles from their subordinate battalions. This distance makes effective TRO by the brigades difficult.

The end result of both of these issues is the potential that the training and readiness of the engineer force in support of the BCTs could suffer. Instead of

improving the effectiveness of the Engineer Regiment, there is a strong potential that it could reduce its effectiveness.

### Over Specialization

The transformation of the Engineer Regiment has created two very specialized types of battalions – the Combat Effects battalions and the Construct Effects battalions. This is not significantly different than the previous organization with Combat battalions and Combat Heavy battalions. This transformation is very effective in standardizing the force. It eliminates the multiple variants of the old battalions – i.e. the corps combat, the divisional mechanized, divisional light, corps wheel, etc. – and establishes the two baseline battalion headquarters as the only two variants within the force. What it also does is add to the specialization of the engineer force pool. While this specialization simplifies the organization, training and command and control of the engineer force, it has the opposite effect from the BCT perspective.

As an example, look at the two BCT sectors in Afghanistan during OEF8. Each IBCT has only their organic engineer company, so there are numerous engineer missions requiring EAB engineer support. These missions range from route clearance support to road and vertical construction support. There are two EAB engineer battalions – one transformed combat and one combat effects - operating within the engineer brigade supporting the BCTs and CJTF76/82. The combat battalion is organized and focused solely on providing route clearance support across both BCT sectors. Similarly, the construction effects battalion is organized to provide construction support across both sectors. This specialization has allowed the engineer battalions to very effectively focus on their lanes, and have allowed for improvements in the

efficiency that route clearance and construction are conducted across the AOR. But from the BCT commanders perspective, he now has three different (two separate engineer battalions and his organic company) operating within his sector. Instead of turning to one senior engineer commander to coordinate all engineer operations within his sector, he must turn to his staff engineer (a major), who then coordinates with the BSTB commander (who owns the organic engineer company) and the two separate engineer battalions and engineer brigade in order to coordinate the missions. It would seem that this specialization of engineer battalions has again failed to weigh the main effort of support to the BCT commanders.

Alternative Solutions: In order to correct the under-representation, TRO, and over specialization issues, any feasible alternative must do three things. First, it needs to provide the BCT with a robust command and control organization that can plan and coordinate all engineer operations within the BCT. Second, it must ensure there are adequate multifunctional engineer forces capable of providing the BCT with full spectrum engineer support. Finally, it must eliminate the TRO issues created by the elimination of the senior divisional engineer commander and the geographic dispersion inherent in the current structure. I propose three alternative solutions: the BCT Engineer Battalion option, the BSTB Plus option and the Multi-functional EAB Battalions option.

BCT Engineer Battalion: I have argued that the current Engineer Regiment structure has effectively transformed, standardized and modularized our engineer force, but in the process has left some holes in the support the engineers provide to the BCTs. In light of the Army's commitment to the BCT as the primary warfighting organization, and coupled with future full spectrum environment that the BCT will continue to operate

in, I believe the current BCT and EAB engineer organizations need to be modified. In order to more effectively support BCT operations, I recommend a rotation of the focus of engineer organizations from a functional to an organizational focus. Currently, with the Combat and Combat Effects battalions, the engineer force is very functionally focused. An organization focus would shift instead to BCT support battalions and EAB battalions. The BCT battalions would become organic to the BCTs and the EAB battalions would remain in the functional engineer brigades. Both the BCT and the EAB battalions would become multi-functional battalions with the capability to command and control combat, construction and specialty engineer companies and teams.

The BCT engineer battalion would need to need to have the following capabilities:

1. Command and control all engineer assets operating within the BCT's sector.
2. Plan, integrate, and oversee execution of all engineer operations within the BCT's sector.
3. Perform the Brigade Engineer function.
4. Provide mobility, survivability and counter-mobility support to BCT units.
5. Provide limited organic vertical and horizontal construction capability to the BCT.
6. Provide TF engineer support to maneuver battalions.

Figure 8 shows the organization of this new BCT Engineer Battalion.

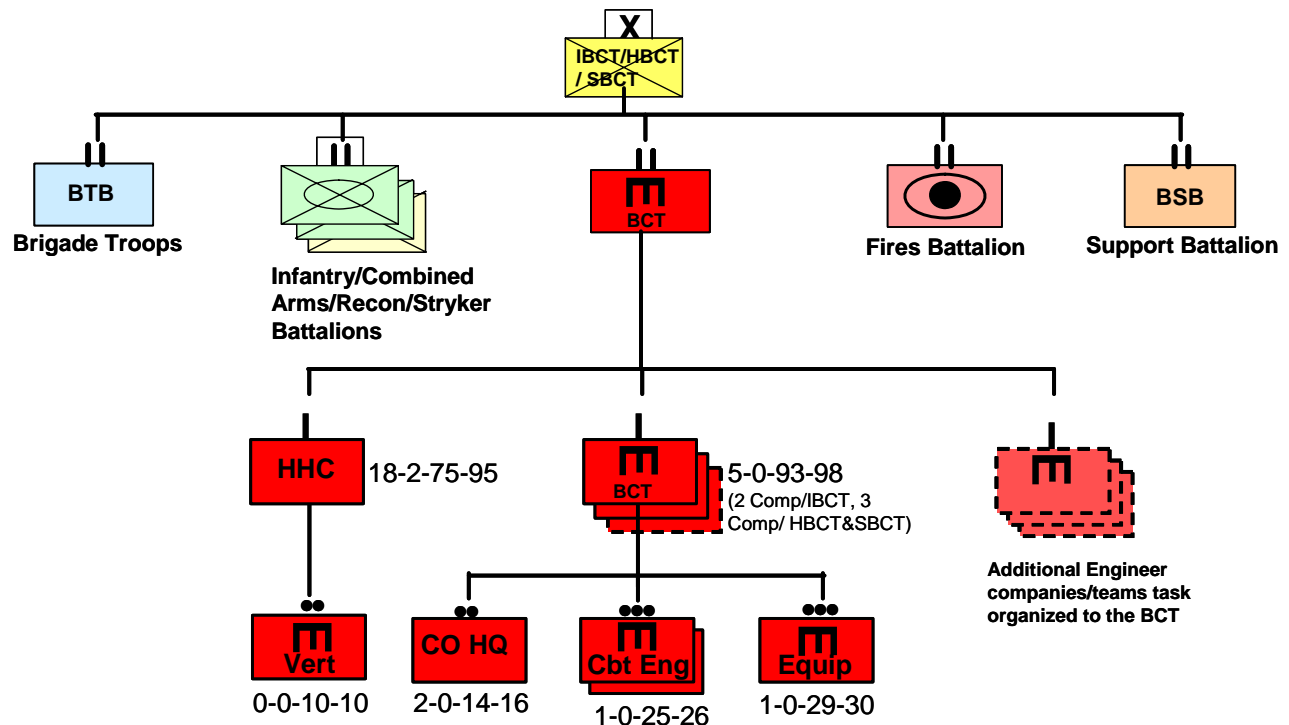


Figure 8.

This new engineer battalion would increase the BCT by 238 soldiers in the HBCT/SBCTs and by 216 in the IBCT. The payoff for these additional personnel and equipment is that the BCT would now have enough organic engineers to conduct all its basic engineer functions. The battalion staff would give the brigade an element robust enough to plan and coordinate all engineer operations. This capability is necessary across the full spectrum of combat operations, but is especially critical during stability operations when the infrastructure support operations demands increase significantly. The line company structure (two for HBCTs and SBCT and two for IBCTs) gives this battalion the ability to further task organize its companies to directly support the maneuver task forces. The multifunctional companies have both sapper and horizontal construction capability. The HHC also has a vertical section which gives the BCT the tools and expertise to do limited vertical construction.

BSTB Plus: An alternative to adding separate engineer battalions in each BCT is to re-designate the BSTB as engineer commands and place the multi-functional companies under the BSTB. This solution is viable provided that the commands are designated as engineer commands with the BSTB commander being dual hatted as the BCT Engineer. The BSTB would need a very robust engineer operations section under a major to plan and coordinate engineer operations across the BCT. It would need similar Signal and Military Intelligence operations sections under additional majors to plan and coordinate Signal and Military Intelligence operations.

The advantage of this option is that it would not create additional battalion headquarters, and therefore would reduce the increase to the BCTs' end strength. This option would also address the TRO issues within the BCT by ensuring that the BSTB commanders are Engineers. It would not address the geographic dispersion issue. The disadvantage is that the BSTB commander would be split focused. He would be responsible for Signal and Military Intelligence operations in addition to engineer missions. This structure would also have to fight the growing tendency of BCT commanders to look at their BSTBs as additional ground commanders and therefore assigning maneuver space to them to occupy and control. (During the last two rotations in Afghanistan, all four BSTBs were used as maneuver commanders.) Designating these battalions as engineer only commands would also face a stiff objection from the Signal and MI proponents that do not want to give up the chance of competing for these commands.

Multi-functional EAB Battalions: This alternative would augment the current brigade engineer cell to make it robust enough to plan and coordinate all engineer

operations within the BCT. It would also then reorganize the EAB from Combat Effects and Construction Effects battalions to a single multi-functional battalion headquarters capable of conducting both combat engineer and construction support operations. The companies would remain organized as outlined in the BCT Engineer Battalion alternative. A portion of these battalions would then be habitually associated with various BCTs. They would train and deploy with these BCTs.

The advantage of this alternative is that it would again result in only marginal increases to the BCT end strength and it would retain a more robust EAB engineer pool to reinforce operations as needed. The disadvantage is that it would not put an engineer commander within the BCT and would relegate the engineer function to a staff function. An argument could be made that this would not solve the requirement for a robust engineer command and control organization. This option also doesn't address the TRO issues. Also, there are not enough EAB battalions in the force structure to support all the BCTs, so each battalion would be associated with two to four BCTs. This would again water down the relationship that the battalion commander would have with each of his supported BCT commanders, and similarly reduce the dedicated engineer support to the BCTs.

### Recommendation

The BCT Engineer Battalion Option. Although the BSTB Plus and Multi-functional EAB Battalions options are viable alternatives, neither fully address the gaps identified in the current engineer support plan. The BCT Engineer Battalion option would provide more effective engineer support to the BCTs. The battalion headquarters would also be in place and ready to accept additional engineer modules that may be task organized to

the BCT for specific missions. This would provide unity of command of all engineer elements operating within the brigade's sector. This organization would also provide the brigade commander with a single point of coordination for all engineer missions. TRO would be provided by the BCT engineer battalion commanders for BCT elements and by the functional engineer brigades for EAB elements. Provisions could be made to co-locate the EAB battalions with their brigade headquarters to eliminate the geographic dispersion problem as well.

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The preferred solution would be for this change to be implemented by increasing the engineer force pool. Reality and force structure cap numbers dictates that the change be implemented without a significant increase in the overall size of the force pool. This would require pulling the companies forward into the BCTs from the current EAB engineer battalions. Table 1 shows that this proposal would require an additional 35 (rounded up from 34.3) combat engineer companies, 24 (rounded up from 23.8) horizontal companies and 10 vertical companies to augment the projected 40 active duty BCTs.<sup>25</sup> (For this discussion, I am grouping Sapper, MAC and Clearance companies together under Combat Engineer companies, and ESC and Horizontal companies together under Horizontal Construction companies.)

BCTs		Platoons, Currently			Platoons, Proposal			Delta (# Platoons)		
Type	#	Combat Engr	Horizontal Constr	Vertical Const	Combat Engr	Horizontal Constr	Vertical Const	Combat Engr	Horizontal Constr	Vertical Const
HBCTs	19	3	1	0	6	3	0.25	3	2	0.25
IBCTs	17	2	0.5	0	4	2	0.25	2	1.5	0.25
SBCTs	4	3	1	0	6	3	0.25	3	2	0.25
Total (plts):								103	71.5	10
Total (Co=Plt/3):								34.3	23.8	3.3

Table 1.



Table 2 then takes these required companies numbers, compares them to the current engineer force pool and shows that 13 Combat, 11 Horizontal and 8 Vertical companies would remain in the EAB engineer pool. These companies would be organized into eight multi-functional engineer battalions that would also provide the command and control for the specialized engineer companies and detachments.

	Combat Engr Companies				Horizontal Comp			Vertical Companies
	Sapper	MAC	Clearance	Total	Horizontal	ESC	Total	
Current	23	13	12	48	24	11	35	12
Proposal				35			24	4
Delta(EAB Bns)				13			11	8

Table 2

The end result would be 40 multi-functional BCT Engineer Battalions and 8 multi-functional engineer battalions.

#### Shortfalls/Risk

This proposed structure clearly weighs support to the BCT at the cost of a robust EAB engineer force. Without a growth in the engineer force pool, support for EAB units such as Sustainment Brigades, Maneuver Enhancement Brigades, and higher headquarters would be limited to what could be provided by the eight EAB battalions. To mitigate this risk, I would propose a growth of seven multi-functional EAB engineer battalions that would then be task organized under the five active duty engineer brigades. This growth would add approximately 3600 additional engineer slots, but would maintain the current 7%<sup>26</sup> engineer to total force ratio with the projected Army end-strength growth<sup>27</sup>. These additional battalions would give each brigade 3 battalions plus all supported specialized detachments under their control. The battalions could be added in order to be co-located with their engineer headquarters at Ft. Bragg, Ft. Lewis, Ft. Hood, Schofield Barracks and Germany to address the EAB TRO issues. This

additional force structure, coupled with support from Reserve Component engineers, would offset the shortfall created by pulling the engineers forward into the BCTs.

### Conclusion

Afghanistan and Iraq has shown that current warfare is a brigade commander's fight. With the transformation to modularized BCTs, it is clear that future combat will continue to be executed at the BCT level. The nature of full spectrum combat also points to a continually changing environment that will require these BCTs to transition from stability to major combat operations rapidly and often. It is therefore critical that the BCT commander has all those assets under his control that are needed to conduct basic missions along the full spectrum of operations. Recent operations in Afghanistan and Iraq has also shown the wide range of engineer missions – from IED defeat and route clearance to FOB construction and local national infrastructure support – that the future force will face. The current BCT structure is very under represented by engineer forces and does not provide the BCT commander with adequate assets to complete the missions he is likely to face.

The recommended shift to a BCT engineer battalion structure is a significant shift in focus from a functional based engineer structure to a BCT focused structure. This shift is necessary in order to bring the Engineer Regiment in line with the overall Army focus. This proposed structure bridges the perceived gaps of under-representation and over specialization and makes engineer forces more relevant to the future fight. Finally and critically, this structure will provide the BCTs with a sufficient engineer force that is capable of handling the likely challenges that the BCTs will face in the full spectrum warfare of the future.

## Endnotes

<sup>1</sup> The Honorable Francis J. Harvey and General Peter J. Schoomaker, "A Statement on the Posture of the United States Army 2007," (Washington, D.C.: U.S. Department of the Army, 14 February 2007), i.

<sup>2</sup> *ibid*: Introduction.

<sup>3</sup> U.S. Department of Defense, *Joint Operations*, Joint Publication 3-0, (Washington, D.C.: U.S. Department of the Defense, 17 September 2006), xvi.

<sup>4</sup> U.S. Department of the Army, *Operations*, Field Manual 3-0 (Washington, D.C.: U.S. Department of the Army, 2007 pre-publication draft), 1-2.

<sup>5</sup> U.S. Department of the Army, *Counterinsurgency*, Field Manual 3-24 (Washington, D.C.: U.S. Department of the Army, 15 December 2006), 1-2.

<sup>6</sup> Robert M. Gates, remarks given at Kansas State University, Manhattan, Kansas, November 26, 2007.

<sup>7</sup> FM 3-0, 1-2.

<sup>8</sup> Donald H. Rumsfeld, *The National Defense Strategy of the United States of America*, (Washington, D.C.: The Pentagon, March 2005), 3.

<sup>9</sup> FM 3-24, 1-8.

<sup>10</sup> FM 3-0, 2-1.

<sup>11</sup> FM 3-0, 3-1.

<sup>12</sup> FM 3-0, 3-7.

<sup>13</sup> FM 3-0, 3-19.

<sup>14</sup> U.S. Department of the Army, *The Army Modular Force*, Field Manual 13-0-1 (Washington, D.C.: U.S. Department of the Army, 2006), 1-11.

<sup>15</sup> FM 13-0-1, 1-13.

<sup>16</sup> Harvey and Schoomaker, p10.

<sup>17</sup> Jack Sterling, "Engineer Regimental Update" briefing slides from U.S. Army Engineer Pre-Command Course 01-08, Fort Leonard Wood, MO, 9Oct07, slide 5.

<sup>18</sup> Sterling, Slide 7.

<sup>19</sup> U.S. Department of the Army, *Engineer Operations*, Field Manual 3-34 (Washington, D.C.: U.S. Department of the Army, 25 October 2007 pre-publication draft), B3 –B5.

<sup>20</sup> FM 3-34, E1-E2.

<sup>21</sup> FM 3-34, B1.

<sup>22</sup> Sterling, Slide 9.

<sup>23</sup> Sterling, slide 10.

<sup>24</sup> Sterling, slide 16.

<sup>25</sup> I used 40 total BCT based on the 76 total number given in the 2007 Posture statement. The 19 HBCT number came from slide 8 of BG Sterling's Regimental Update brief. The rest of the current numbers came from slide 17, Sterling Brief.

<sup>26</sup> Sterling, slide 12.

<sup>27</sup> Department of the Army Information Brief "Grow The Army (GTA) Stationing", 19 December 2007, slide 2.

